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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/881,092	06/15/2001	Kiril A. Pandelisev	PHOENIX SCIENTIFIC	7264

James C. Wray
Suite 300
1493 Chain Bridge Road
McLean, VA 22101

EXAMINER

VINCENT, SEAN E

ART UNIT	PAPER NUMBER
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1731

DATE MAILED: 08/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/881,092	PANDELISEV, KIRIL A.	
	Examiner	Art Unit	
	Sean E Vincent	1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-148 is/are pending in the application.
- 4a) Of the above claim(s) 1-77 and 109-118 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 78-108 and 119-148 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of group III, claims 78-108 and 119-148 in the response filed July 11, 2003 is acknowledged. The traversal is on the ground(s) that all claims are classified in the same class and all subclasses are examined in the same art unit. Further, the process cannot be practiced with another materially different apparatus and the subcombinations are not separately usable. This is not found persuasive because the applicant failed to state why subcombinations are not separately usable or why the processes cannot be practiced with other apparatus. Applicant has expressed disagreement with the examiner's position but pointed out no supposed errors in the reasoning presented by the Examiner in the restriction requirement. The requirement is still deemed proper and is therefore made FINAL.

2. Applicant has provisionally elected "the species of Figure 8". Since figure 8 illustrates the apparatus of the non-elected claims of group II, the election of species is non-responsive. In the interest of compact prosecution, the above election of group III claims will be maintained while the election of species will be withdrawn. Since the applicant did not elect one heating species as required, the separate heating species described in the restriction requirement will be considered equivalents, i.e. not patentably distinct from one another.

Claim Objections

3. Claim 135 is objected to because of the following informalities: it depends from claim 137. Appropriate correction is required.
4. Claim 146 depends from claim 149. Appropriate correction is required.

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5. Applicant is advised that should claim 103 be found allowable, claim 104 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 78-108 and 119-148 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 78 is indefinite because several method steps are recited without clear antecedent basis. Line 7 of the claim states "heating, softening, drying and removing OH", but it is not clear whether these steps are performed on raw silica powder or some intermediate powder product.

9. Claims 85 and 86 are further indefinite because the silica powder is generated within the chamber and the above heating step does not state whether precursor gases, generated silica powder, introduced silica powder, softened silica powder or OH removed silica powder is heated. Method claims should be written in positive step action format wherein each method step acts on a material and makes a product which is subsequently acted upon by the following method step until the final product is obtained.

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10. Claim 99 recites the limitation "the multiple heat zones" in line 1. There is insufficient antecedent basis for this limitation in the claim.

11. Claim 119 is indefinite because it is directed to a method for providing fused silica grains, but contains a method step of "agglomerating the particles with other heated particles, and with the collector" which seems to suggest that the final product is not fused silica grains, but a fused silica coating on the collector.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 78-83, 85, 88-93, 95-97 and 105 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nath (EP 127956) in view of Leber et al (US 4923497).

14. Nath taught methods of producing silica grains in a chamber with gas inlets and outlets and a vacuum line by directing silica precursor gases into an Argon RF plasma and collecting pure or doped silica powder in collectors (see abstract, Figures 1 and 2, page 4, line 18 to page 6, line 2 and examples 1, 3 and 4). Nath disclosed further in-mold sintering, but did not teach softening or agglomerating the powder. Leber et al taught methods of continuous production of tubes or rods of silica wherein silica powder was fed to and heated within a crucible in a protective argon-hydrogen atmosphere to soften and flow the silica through an annular passage around a shaping tool and draw the silica into tubes or rods (see the figure, col. 2, lines 42-60 and

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col. 3, lines 3-52). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the powder of Nath within the process of Leber et al because: a) Nath taught that its glass powders could be later formed into any shape necessary and b) Leber et al taught that its continuous method was advantageous over non-continuous methods.

15. With regard to claim 80, Nath taught that the collecting plate 20 could be raised or lowered, but did not teach rotating the plate. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to rotate the plate of Nath because it would have helped to maintain an even powder deposit.

16. With regard to claim 81, Nath did not teach that the vacuum line was valved. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a valve in the vacuum line of Nath because valves are very well known in the plasma glass deposition arts.

17. With regard to claims 79 and 82, Nath did not state specifically that the plasma was centered above the collection plate. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to center the plasma above the collection plate because it would have been expected that a centered plate would hold more powder.

18. With regard to claim 92, Nath did not teach that the collector plate was heated or passing gases through the glass powder on the plate. Leber et al taught that its crucible was heated and that protective gases were passed through the glass powder while heating. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ the heating technique of Leber et al to the powder of Nath because Leber et al taught that it would produce glass with less imperfections.

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19. With regard to claim 105, Nath did not teach microwave plasma heating. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use microwave instead of RF because the different heating methods are considered equivalents (see above "Election/Restriction")

20. Claims 119-125, 127, 129-138 and 142-144 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leber et al in view of Röss et al (US 5049175).

21. Leber et al taught methods of continuous production of tubes or rods of silica wherein silica powder was fed to and heated within a crucible in a protective argon-hydrogen atmosphere to soften and flow the silica through an annular passage around a shaping tool and draw the silica into tubes or rods (see the figure, col. 2, lines 42-60 and col. 3, lines 3-52). Resistance and inductance heating were disclosed. Electrical field application was disclosed. Leber et al did not teach supplying doped and undoped silica particles to a collector. Röss et al taught methods of providing fused silica grains by controllably feeding grains of silica and various dopants to a granular body on a rotating support and heating to vitrify the grains and stabilize the shape of the granular body (see abstract, figures, col. 1, lines 55-60 col. 6, line 48 to col. 7, line 5 and col. 7, lines 26-32). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to used granule mixtures from Röss et al in the method of Leber et al because Röss et al taught that any desired cross-sectional distribution could be achieved.

22. Leber et al did not teach actively controlling the pressure in the crucible. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to control the pressure because Leber et al was concerned with maintaining a protective atmosphere and exhausting gas in connection 12 was illustrated. The further step of actively controlling the

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pressure would have required no more than pressure monitoring and adding a valve to connection 12, both of which were very well known in the art of silica vitrification. Note that another connection, not shown, was disclosed to exhaust gases from the bottom end of the crucible.

23. With regard to claims 124 and 125, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use microwave plasma or RF heating in Leber et al because they were considered equivalent to the resistance heating disclosed.

24. With regard to claim 132, Leber et al clearly discloses "tube or rod" formation. While no specific embodiment is disclosed in Leber et al for tube formation, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Leber et al to make tubes. Note that an obvious modification to the tool 5 and rod 6 of Leber et al's figure 1 would have been expected as was previously known in Gray and Jenkins et al (cited by applicant). The obvious modification would have been to make the tool and rod of Leber et al hollow.

25. With regard to claim 138, Leber et al does not disclose concentric ring electrodes because it does not disclose that the tool 5 is hollow (see above). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use concentric ring electrodes in Leber et al because the obvious modification to the tool 5 to make tubes instead of rods would have necessarily resulted in concentric ring electrodes.

26. With regard to claim 144, Leber et al does not disclose connecting a purging or dopant injector to the tool 5 (see above). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to make such a connection with the purging gas already disclosed by Leber et al because the obvious modification to the tool 5 to make tubes instead of

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rods would have made the previously known gas injection of Gray and Jenkins et al (cited by applicant) necessary for tube production.

27. Claims 84, 86 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nath and Leber et al as applied to claim 82 above, and further in view of Mansfield (US 4689212).

28. Nath and Leber et al failed to disclose particle injection into a plasma. Mansfield taught that doped silica could be produced by a plasma burner fed with solid silica and dopant material or with solid dopant material and gaseous silica precursors (see figures, abstract and col. 2, lines 5-36; col. 3, lines 17-48; col. 4, lines 14-49 and col. 4, line 62 to col. 5, line 27). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate solid feed materials into the method of Nath because Mansfield taught that dopants could be easily added directly to the plasma.

29. Claim 128 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leber et al and Röss et al as applied to claim 119 above, and further in view of Mansfield.

30. Leber et al and Röss et al failed to disclose providing silica particles from burners.

Mansfield taught that doped silica could be produced by a plasma burner fed with solid silica and dopant material or with solid dopant material and gaseous silica precursors (see figures, abstract and col. 2, lines 5-36; col. 3, lines 17-48; col. 4, lines 14-49 and col. 4, line 62 to col. 5, line 27). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the burners of Mansfield in the methods of Leber et al and Röss et al because Mansfield taught that dopant concentrations were easily controlled.

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Allowable Subject Matter

31. Claims 94, 98-104, 106-108, 126, 139-141 and 145-148 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

32. The following is a statement of reasons for the indication of allowable subject matter:

The prior art does not teach or fairly suggest methods of producing silica grains as claimed wherein any of the following features are claimed:

- a. a second vacuum chamber below the first chamber
- b. multiple or distinct heat zones heated to different temperatures
- c. gas plasma surface removal subsequent to pulling
- d. a second chamber for reforming silica from the first chamber
- e. a second crucible beneath the heated throat of the first crucible.

It would not have been obvious to modify the prior art to have any of these features.

Conclusion

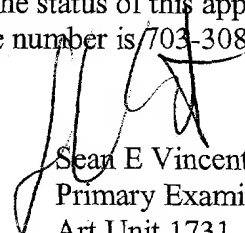
33. The prior art made of record and not relied upon is cited to further show the state of the art.

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sean E Vincent whose telephone number is 703-305-3607. The examiner can normally be reached on M - F (8:30 - 6:00) Second Monday Off.

35. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven P Griffin can be reached on 703-308-1164. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

36. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0651.

S Vincent
August 11, 2003


Sean E Vincent
Primary Examiner
Art Unit 1731